

A Nonpunitive, Computerized System for Improved Reporting of Medical Occurrences

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Abstract

To improve the patient safety program at the Naval Hospital at Oak Harbor, the facility instituted a new computerized system of reporting errors, incorporating a nonpunitive approach. The new “Culture of Safety” led to a paradigm shift in assessing an individual’s performance, event occurrences, and error reporting. Prior to the patient safety initiative, under the then-existing error reporting system, staff members at the Naval Hospital at Oak Harbor were held personally accountable and subject to discipline for errors they committed. Under the Culture of Safety program, most errors are considered preventable and attributable to systems issues. The new reporting system is used to assess systems failures, not individual performance. Staff may input errors and occurrences directly into the computerized database or submit paper reports. Although anonymous reporting is allowed, staff members are encouraged to identify themselves. Reviewers comment on the errors and occurrences reported to help identify trends and develop baselines for quality improvement activities. Ultimately, the appointed physician advisor for performance improvement summarizes what actions are needed to remediate the problem. The new system provides up-to-the-minute information for review, dissemination, and action, replacing the paper trails and time-consuming meetings that failed to resolve occurrences. Data collected provides feedback to department heads, allowing for monitoring, systems improvement, or environmental changes. Aggregate data are tracked, trended, and fully disseminated.

Introduction

The Naval Hospital at Oak Harbor sought to improve the quality of care provided to our patients by enhancing patient safety.^{1,2} Under our old reporting system, a paper-based Occurrence or Medication Error Report was submitted to the risk manager for action and assignment of reviewers. The paperwork was then sent to each individual reviewer for examination and comment. Only one reviewer at a time could look at and respond to the occurrence report. The system was ineffective, and occurrence reviews took days, weeks, and even months before a final decision could be made on what actions to take. This delay and the lack of timely feedback to hospital staff could lead to reoccurrence of an error.

We needed a new, improved system of reporting occurrences—actual adverse events or near misses that threatened the patients’ well-being or put them at higher risk—to replace the old cumbersome and time-consuming reporting system. We needed a system that would focus on preventing errors.³ The tool,

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which was locally developed, would serve as a mechanism to monitor, identify, and evaluate all medication errors and other occurrences that happened at our facility. Information gained from each occurrence would serve as an invaluable tool to prevent such events from recurring.

This new system of reporting combined computer technology and a new “Culture of Safety” program within the facility. It called for a nonpunitive approach when dealing with staff and handling errors that occurred. The hospital had to undertake a paradigm shift in the way it assessed individual performance and error reporting. Identified adverse events typically are the result of poorly designed systems that either permit errors or make errors difficult to detect and intercept. The staff was reassured that the new Culture of Safety program was assessing systems failures. A responsive method of catching and reporting errors would allow immediate changes to occur in these systems or the environment of care for our patients and staff. It has been the combination of database technology and the promotion of a culture of safety at our facility that continues to make this program a success. The new reporting system’s computerized Occurrence Screen Database allows for up-to-the-minute interactive information for review, dissemination, and action.

System description

The Occurrence Screen Database is based upon the Microsoft® Access database platform. This platform allows the program to easily adapt to any changes or needs of our facility and provides multiple layers of security. The program is password protected and complies with the Health Insurance Portability and Accountability Act (HIPAA) of 1996,^{*} requiring protection of private health information. The database also is linked to Microsoft Outlook, allowing for immediate notification of an occurrence that requires review, comment, or prompt action. The database mimics the information needed for the Department of Defense (DoD) Patient Safety Registry (PSR)^{†4} monthly report submitted to the Armed Forces Institution of Pathology (AFIP)^{‡5} and the MEDMARX^{§M} medication database[§] input. This aggregate data is useful in comparing our facility’s patient safety record to that of other facilities of the same type and size.

^{*} HIPAA required the U.S. Department of Health and Human Services to establish national standards for electronic health care transactions and national identifiers for providers, health plans, and employers. It also addresses the security and privacy of health data.

[†] The DoD PSR is a database that gathers standardized, clinically relevant data on all occurrences and categories of actual events and near misses. The PSR is used to identify and provide feedback on systemic patterns and practices from all three Armed Forces services.

[‡] AFIP is a tri-service agency of the DoD, specializing in pathology consultation, education, and research. Originally founded as the Army Medical Museum in 1862, it was renamed the Armed Forces Institute of Pathology in 1949, transforming into an international resource for pathology and the study of disease.

[§] MEDMARX National Database for Medication Errors is an Internet-accessible software program that hospitals can use to anonymously report and track medication errors in a standard format. The U.S. Pharmacopeia developed this program to allow users to track their own errors as well as learn from the anonymous experiences of others by searching the database.

Occurrences are immediately entered into our own database, categorized as either a medication error or a nonmedication event. Medication errors are immediately reported to the MEDMARX database as well. AFIP extracts aggregate data on medication errors directly from MEDMARX on a monthly basis. All occurrences are rated for severity under either the Safety Assessment Code scoring system (for nonmedication events) or MEDMARX's severity Category Index Algorithm (for medication errors).

System operation

The staff assigned to our facility is encouraged to immediately report any occurrences, errors, or potentially dangerous situations to the patient safety specialist. They are encouraged to identify themselves when submitting an occurrence, but are not required to do so; strict anonymity is kept for those who request it. They also are not required to identify any other staff members involved. Only the patient safety specialist, risk manager, and physician advisor have access to all of the stored information involving the occurrences.

Submission of an occurrence, including a medication error, can be accomplished in different ways (Figure 1). An occurrence can be directly entered into the system by the staff at any work station. Alternatively, the information on the event can still be turned in via a hospital form or written out on a blank piece of paper, or the staff can inform the patient safety specialist in person or via e-mail. If the occurrence is submitted by a means other than direct computer entry, the patient safety specialist will input the event into the system. The occurrence report may or may not include any identifiable patient information. However, a brief synopsis of the occurrence is required for entry into the electronic input screen within the system (Figure 2).

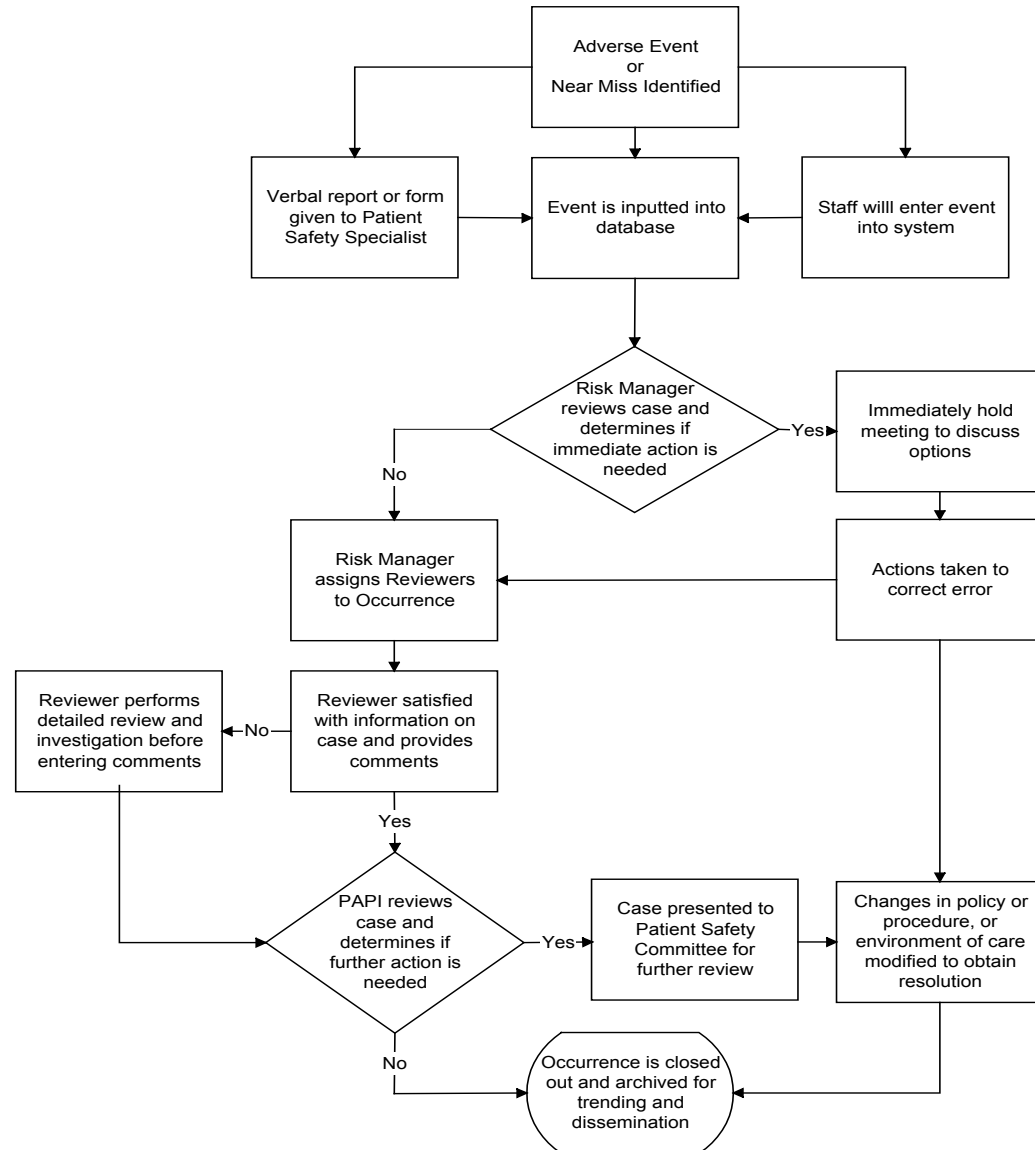
Once the occurrence is entered into the data system, the risk manager assigns reviewers. Up to 10 individuals can be assigned as reviewers for any one occurrence (Figure 3). All staff assigned as reviewers have been trained on HIPAA and are required to ensure that information is not disclosed inappropriately. Factors considered when determining who will be assigned as reviewers include the following:

- Did the occurrence happen within a department?
- Did this happen within a certain specialty?
- Are any licensed providers involved?

Assigned reviewers all receive a simultaneous e-mail stating that they have an occurrence requiring review (Figure 4).

Each reviewer has an assigned area in which to input his or her comments. A reviewer can read the comments made by other reviewers but cannot change the data. If reviewers require more information than what is provided within the occurrence form, they can research on their own the radiographs, lab values, and record reviews. If necessary, reviewers may interview involved staff to gather an opinion on the occurrence. Once all the reviewers have made their comments, the

Figure 1. Occurrence screen reporting flow diagram



final authority on each occurrence falls directly on the appointed physician advisor for performance improvement (PAPI) at our hospital. This provider will decide what actions are appropriate for the occurrence to be resolved. Situations may dictate that immediate actions or changes in systems or environments are necessary (Figure 5). This immediate response would not be possible with the previous time-consuming, paper-based system.

The submitted information is tracked over time and reviewed to see if any trends are occurring that might need more attention. If a trend is discovered, a review of the system or systems in place is conducted to see if any improvements can be made. Staff retraining or reassignment might be necessary, if indicated by the trends. Proactive reviews of high-risk systems are conducted at least annually or when deemed necessary by recurrent events. A well-organized team conducts a

Figure 2. Automated Occurrence Screen Database input screen

Microsoft Access - [Risk Occurrence Screening Program]

File Edit View Insert Format Records Tools Window Help

Control Number: OC-30102 Risk Management Occurrence Screen

Patient Name: * Patient SSN: * PCM: *

Occurrence Date: * Occurrence Time: * Location: *

Physician Notified: * Date Physician Notified: * Time Phy. Notified: * Physician Name: *

Comments on Event

Env. Of Care Other/Misc Suicide Attempt Delay in diagnosis Elopement Equip. Related Document Problems Assault Wrong site surgery

CANCEL
Cooling/Heating
Fire
Hazardous material
Medical gases
Security breach

Operative/Other Patient Falls Perinatal Lab Error Readmission Transfusion Staff Injuries Consent Issues Identification Radiology

CANCEL
Improper Prep
Incorrect Instrument Count
Incorrect Needle Count
Incorrect Sponge Count
Omission of part of procedure

Submit Record Return to Main Menu

Form View CAPS

Figure 3. Assignment of reviewers to hypothetical case

Microsoft Access - [Naval Hospital Oak Harbor - Risk Occurrence Screening Program]

File Edit Insert Records Window Help

Control Number: OC-30101 Patient Name: Joe Smuckatelly Patient SSN: 01/000-00-0001

Occurrence Date: 04-May-04 Occ. Time: 2:00 PM Physician Notified: [X] Physician Name: Jett Jackson

Location: MOTHER INFANT UNIT Date Phy. Notif.: 04-May-04 Time Phy. Notif.: 30-Dec-99

PCM: Ima Gene

This patient was born via C-Section. Patient's respiratory status deteriorated and required that he be intubated and placed onto mechanical ventilation. Staff set up the ventilator and placed patient onto the equipment. Patient had continued high pressure alarms initiated, continued oxygen desaturation. Staff believed that the ventilator equipment malfunctioned. Patient removed from ventilator and transferred to another facility for a higher level of care.

Equip. Related

Equipment malfunction

BOONE
GENE
GRAMMER
JACKSON
JONES
SMITH

Return

E-Mail Assignments

Assignments

JACKSON	JONES	SMITH							
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Figure 4. E-mail notification of assignment

Microsoft Access - [Naval Hospital Oak Harbor - Risk Occurrence Screening Program]

File Edit Insert Records Window Help

Control Number: OC-30101 Patient Name: Joe Smuckatelly Patient SSN: 01/000-00-0001

Occurrence Date: 04-May-04 Occ. Time: 2:00 PM Physician Notified: ☒ Physician Name: Jett Jackson

Location: MOTHER INFANT UNIT Date Phy. Notif: 04-May-04 Time Phy. Notif: 30-Dec-99

PCM: Ima Gene

This patient was born via C-Section onto mechanical ventilation. Staff pressure alarms initiated, continued oxygen desaturation. Patient removed from ventilator.

Equip. Related

Equipment malfunction

BOON
GENE
GRAM
JACKS
JONES
SMITH

Assignments

JACKSON JONES SMITH

New Occurrence screen = OC-30101 - Message (Rich Text)

Arial 10

File Edit View Insert Format Tools Actions Help

Send

To:

Cc:

Subject: New Occurrence screen = OC-30101

Please review the occurrence screen OC-30101 and make comments.

Figure 5. Final review by physician advisor for performance improvement

Microsoft Access - [Naval Hospital Oak Harbor - Risk Occurrence Screening Program]

File Edit Insert Records Window Help

Command Occurrence Screening Program

Control Number: OC-30101 Patient Name: Joe Smuckatelly Patient SSN: 01/000-00-0001

Occ. Date: 04-May-04 Occ. Time: 2:00 PM Phy. Notified: ☒ Phy. Name: Jett Jackson

Location: MOTHER INFANT UNIT Date Phy. Notif: 04-May-04 Time Phy. Notif: 30-Dec-99

PCM: Ima Gene

This patient was born via C-Section. Patient's respiratory status deteriorated and required that he be intubated and placed onto mechanical ventilation. Staff set up the ventilator and placed patient onto the equipment. Patient had continued high pressure alarms initiated, continued oxygen desaturation. Staff believed that the ventilator equipment malfunctioned.

Equip. Related

Equipment malfunction

JACKSON JONES SMITH

After review of the case, it was found that the ventilator did not malfunction. Instead, the equipment was found incorrectly set up. This led to a possible break down of the equipment. The staff in the unit had not been adequately retrained on its use. The equipment is High Risk Low Volume use. Immediate actions necessary! Equipment pulled off line and placed on work order. New ventilator placed on order. Immediate retraining to be given to all personnel. Follow up review necessary.

Return

Archive Record

Health Care Failure Mode Effects Analysis (HFMEA) on those processes within a system that present the most potential to harm our patients. All stakeholders in the system processes are included within the team. Remedial actions could include changes in policies and procedures, replacing equipment, and retraining staff.

If an adverse event does reach a patient, the occurrence or medication error may require a formal review of the process or system. A root-cause analysis (RCA) is performed to systematically identify processes or system problems that result in a variation in performance. If needed, changes in policy or procedure are made to improve patient safety. This form of review is a reactive method to occurrences that have already happened.

The collected data also are provided as feedback to department heads. The department heads are able to determine if personnel need monitoring, systems need improvement, or environmental changes are needed to make the area safer for our patients. The data are fully disseminated throughout the hospital and presented at meetings to the Board of Directors, Executive Committee of Medical Staff, Executive Committee of Nursing Staff, Medical Staff, Pharmacy and Therapeutics, Environment of Care, Executive Steering Committee, Infection Control, and the Patient Safety Committee. Formal reviews of the data collected on the occurrences and medication errors are performed at least monthly by the Patient Safety Committee.

Errors involving providers are reviewed at both Medical Staff Committee meetings and Executive Committee on Medical Staff meetings to determine whether a given occurrence warrants an entry into the Clinical Activity File (CAF) of the provider. The decision to make this type of entry is determined by the provider's peers. The CAF file entry is automatically generated from the database, when deemed appropriate.

Once an occurrence is closed, the risk manager archives the report. The archived report can be used later for tracking and trending data, or recalled for further review.

Staff involvement

The staff has been involved with the Occurrence Screen Database system from its inception. It is their involvement that has made the program a success. Ongoing training is provided to all staff on patient safety programs and requirements. Routinely, the hospital performs a 100-percent patient safety training stand down, during which almost all medical operations are suspended while staff who are not directly caring for inpatients participate in training that emphasizing error reduction and reporting procedures. At the Command Orientation Program, new personnel receive a detailed presentation on how to report errors and what their involvement is in the system, and they are reassured that error reporting is nonpunitive. Facility leaders emphasize that each individual is a vital part of the program, no matter what job or position he or she holds. Truly it is a team effort in reducing the chances of errors.

The Naval Hospital, Oak Harbor's leadership feels that an open environment should prevail when dealing with errors. Even if members of the group with little or no experience see something they are uncomfortable with, they should feel free to express themselves. Everyone's opinions are valuable, because everyone helps make the care delivered to our patients safe.

Barriers to overcome

Like any new system that is implemented, there are barriers at initiation. The Occurrence Screen Database has had numerous barriers to overcome to make it a success. Some of the barriers experienced were as follows:

- “Culture of Safety”: The staff had to be convinced of the nonpunitive approach to error reporting. The hospital directors had to promote the philosophy of prevention instead of punishment when dealing with discovered errors.
- Staff buy-in: The staff had to be active participants and involved in making the program work.
- Technology: As with any new system, the program did have some initial technical difficulties to overcome.
- Training: Training on the new system had to be provided throughout the hospital, requiring many man-hours.

System improvements and measures of success

The implementation of the new reporting system and the advent of the Culture of Safety program have seen a dramatic increase in the number of occurrences and errors reported over 2 years. For calendar year 2002, a total of 910 occurrences (786 nonmedication events and 124 medication errors) were reported. The number of reports filed for 2003 increased to 1,661 occurrences (1,434 nonmedication events and 227 medication errors). A much more visible measurement of success is the number of individuals who have self-reported errors. The staff feels confident in knowing that they will not be sanctioned for mistakes that are not malicious in nature. Recently, surveys were taken among the staff on their willingness to report occurrences without fear of retribution. The survey results found that 90 percent of the staff felt confident in their error reporting. A total of 8 percent felt that only a slight chance of adverse actions would be possible. Only 2 percent of our staff did not feel comfortable enough to report any and all occurrences.

An improvement in the timeliness and accuracy of the system was also achieved and facilitated measurement. The previous system could take weeks to months to complete and review an occurrence. Our new system has decreased the average time of occurrence review from months to a maximum of 2 weeks. The usual occurrence can be closed out in as little as 72 hours. The status of any occurrence report can be tracked up-to-the-minute. This automated system of data

collection has also made reporting of occurrences to higher authorities⁵ easier and more accurate.

Conclusion

The Naval Hospital at Oak Harbor had major goals in adopting its patient safety initiative. The first goal was to obtain a working “Culture of Safety” program throughout our facility. A “culture of blame” in a complex medical system can leave a facility vulnerable to errors. Since inception of the nonpunitive program, the number of reported events has dramatically increased, showing willingness of staff to report errors. Second, we needed to improve our system to provide a more timely and accurate method of reporting errors. The ultimate goal was to uncover real and potential problems at an earlier stage so that appropriate lessons can be learned and corrective actions taken. Attaining a sound patient safety program was one of the top goals set by our commanding officer. Her leadership helped to inspire the staff to participate in our program. The implementation of our Occurrence Screen Database has more than adequately accomplished these goals.

Acknowledgments

The new system of error reporting at our facility is what has evolved into the Occurrence Screen Database. The program was originally developed by Mr. Terry M. Cook, CDR (ret), RN (risk manager); Captain James E. Kohl, RN, NC (senior nurse executive coordinator); and Mr. Daniel R. Wolniakowski (medical information department head and program designer). Through their unrelenting efforts, the system has been perfected. Lieutenant Scott J. Messmer, RN, NC (performance improvement coordinator) aided in staff compliance when utilizing the new system. It was the collaboration of these individuals and the support of the commanding officer at Naval Hospital, Oak Harbor, that made this project a success.

Captain Susan B. Herrold assumed the command at Naval Hospital, Oak Harbor, in May 2003. Her continued support of the occurrence and medication error reporting system has made it a continued success. Captain Herrold’s emphasis on teamwork, patient-centered care, and continuous improvement has furthered the efforts of the system.

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References

1. Kohn LT, Corrigan JM, Donaldson MS, editors. *To err is human: building a safer health system*. A report of the Committee on Quality of Health Care in America, Institute of Medicine. Washington, DC: National Academy Press; 2000.
2. Institute of Medicine. *Patient safety: achieving a new standard for care*. Washington, DC: National Academy Press; 2004.
3. O'Leary, D. Patient safety: instilling hospitals with a culture of continuous improvement. Testimony before the Senate Committee on Government Affairs; Jun 11, 2003. Available at: http://www.jcaho.org/news+room/on+capital+hill/061103_testimony.htm.
4. U.S. Department of Defense. DoD Directive 6025.17, Military Health System (MHS) Patient Safety Program (PSP) (MHSPSP). Washington, DC; 2001.
5. U.S. Department of Defense. DoD Directive 5154.24, Armed Forces Institute of Pathology (AFIP). Washington, DC; 2003.